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## Covert IR Flash User Manual Rev A

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ISO9001:2008 / AS9100:2009 Certified  
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# 1 Overview

The Covert Infrared (IR) flash (Figure 1) is an IR flash for use with outdoor game cameras with built in IR Flashes. The WilliamsRDM IR Flash has a covert enclosure and attaches to a tree to provide additional IR lighting to extend the nighttime range of existing deployed game cameras. The IR flash consists of the IR flash unit, IR Flash Boot and IR sensor. The IR Flash unit is placed on a tree facing the direction where additional IR lighting is needed. The IR sensor is connected to the IR flash unit and placed in a location where it can detect the flash from the game camera(s) that will be used to trigger it. The Boot is used to conceal the connections to the IR flash unit. The IR flash incorporates a light sensor so that during the day it enters a low power mode to conserve power and does not activate until nighttime. During the day the IR flash can be recharged by a WilliamsRDM covert solar device for uninterrupted remote operation.

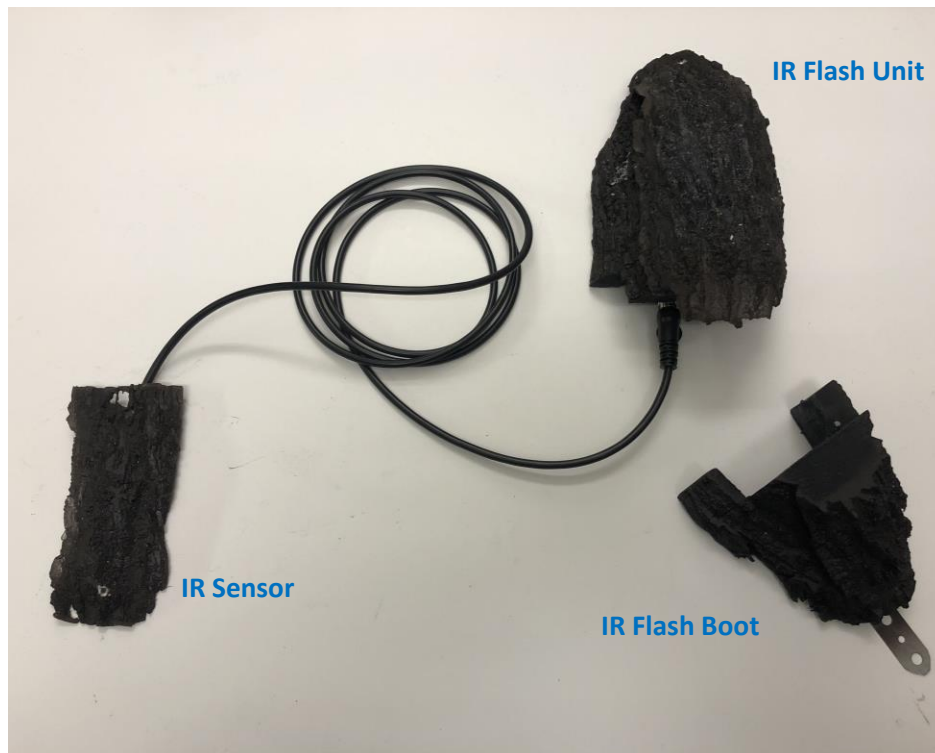


Figure 1: Covert IR Flash System

## IR Flash System Component

- IR Flash Unit
- IR Flash Boot
- IR Sensor with 6.5ft cable

## Key Features

- Covert Enclosure designed to blend in with the environment.
- 180 degree sensor allows multiple cameras to trigger the IR flash.
- Covert IR flashes can trigger each other to illuminate larger areas.
- Quickly Installs to a tree using included screws.
- 940nm IR Illumination for covert operation
- Approximately 300 flashes per battery charge
- Compatible with WilliamsRDM Covert Solar Devices to provide continuous uninterrupted operation.
- Replaceable Rechargeable 18650 Lithium-Ion Batteries

## 2 Covert IR Flash Unit

Figure 2 and Figure 3 show the rear of the IR flash unit. The Power switch is in the “ON” position when it is flipped to the right when viewed from the back. The IR sensor connector is used to connect the IR sensor to the Flash Unit. When the IR sensor is not connected, for instance when the IR flash is stored or being transported, the waterproof cap should be inserted to keep out water and other contaminants. The Solar Input Connector is used to connect a WilliamsRDM covert solar panel to the IR flash unit to recharge the batteries for uninterrupted operation. The aluminum enclosure houses the electronics and rechargeable batteries.



Figure 2: IR Flash Unit Power Switch

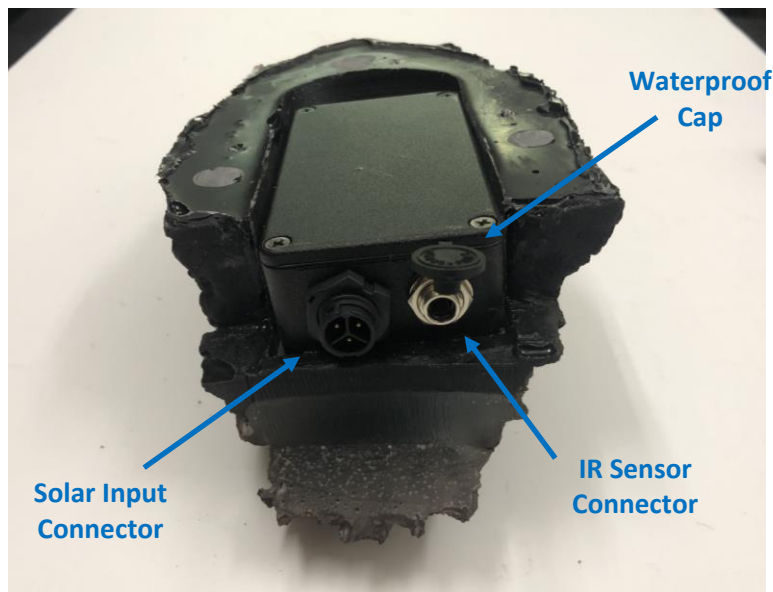


Figure 3: IR flash Unit Connectors

Figure 4 shows the IR Flash Unit's LED indicator which is visible through the translucent enclosure. This Red LED indicator is used to indicate the battery status when the unit is powered on as well as to perform an alignment test. To keep the IR flash unit concealed the LED Indicator is only active for the first 10 minutes after the unit is powered on.

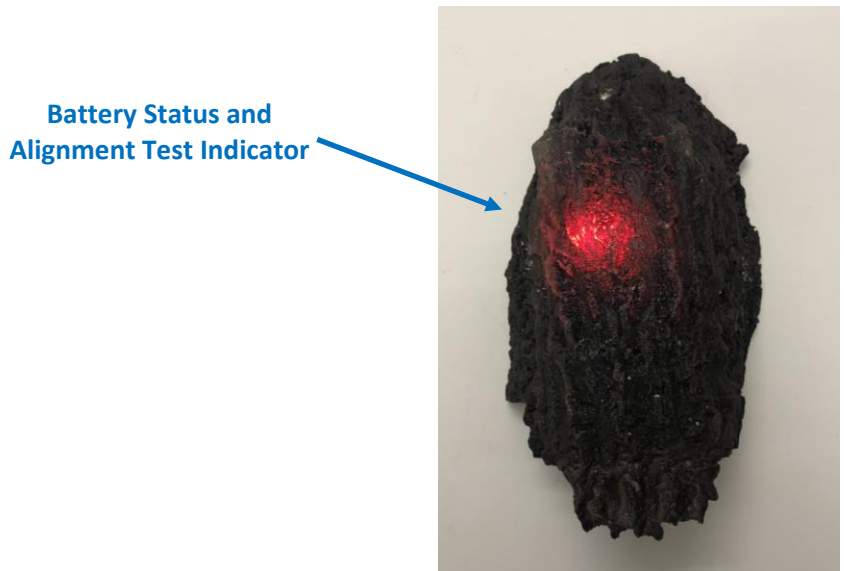


Figure 4: IR Flash Unit Indicator

### 3 Battery Indicator

The battery indicator is located on the front of the flash and can be seen through the transparent housing. When the power switch is turned on the red power indicator on the front of the flash blinks to indicate the battery level. At Full charge the IR flash will generate approximately 300 flashes.

| Number of Blinks | Battery Charge                       |
|------------------|--------------------------------------|
| 5                | 80% - 100%                           |
| 4                | 60% - 80%                            |
| 3                | 40% - 60%                            |
| 2                | 20% - 40%                            |
| 1                | 3% - 20%                             |
| Rapidly Blinking | < 3% Battery Needs Charging          |
| None             | Batteries Exhausted or Not Installed |

## 4 Covert IR Flash Installation

The Covert IR Flash is installed on a tree using the included screws. Figure 5 shows the included mounting hardware used to attach the IR flash to a tree. The 3 mounting holes in the IR Flash unit are pre-drilled to properly install the screws. The IR flash is positioned so that it is illuminating the area of interest. Typically, the flash is facing away from the camera that is taking the picture to minimize glare from the IR flash. Use the 3-inch wood screws to mount the IR flash unit to the tree using the predrilled holes as shown in Figure 5. Three holes are provided to mount the IR Flash unit but typically only two are needed depending on the mounting needs.

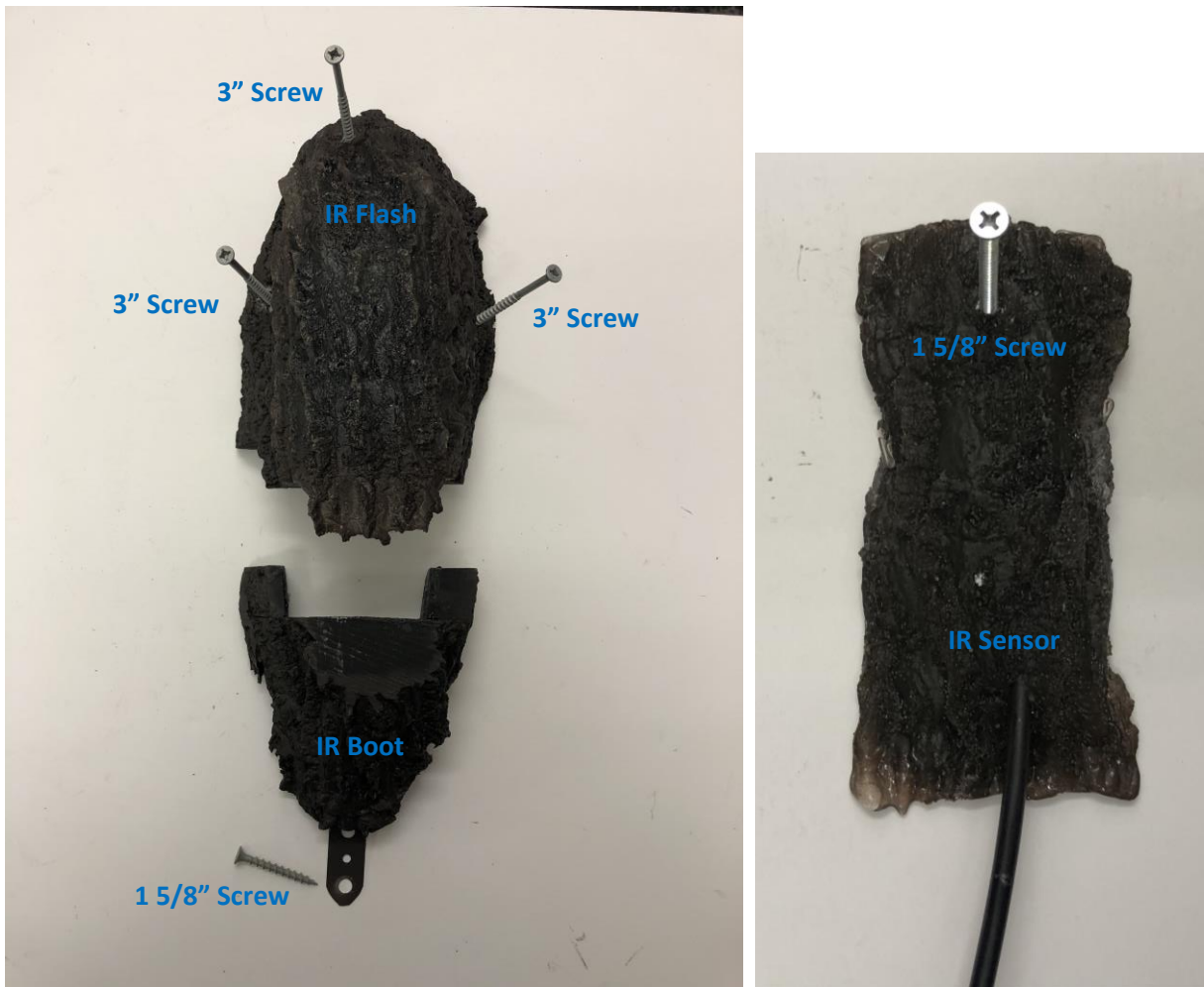


Figure 5: IR Flash Installation Hardware and Screw Locations

Once the Covert IR flash is mounted, the sensor cable is connected to the IR flash and the sensor is mounted using the 1 5/8 inch screw in a location where it can detect the flash from the camera. Ensure the IR sensor connector is fully inserted into the mating connector and that the retaining ring is threaded onto the mating connector on the IR Flash. If this is not done the IR sensor may not function properly. The IR sensor has a 180-degree left-right field of view if it is oriented vertically as shown in Figure 6. The sensor's 180-degree field of view allows multiple cameras with direct line of site to the sensor to trigger the IR flash assuming they are in range and aligned. Optionally, a WilliamsRDM covert solar device can be connected to the IR flash to provide continuous uninterrupted operation. Once the IR sensor is mounted and the optional solar panel is attached the IR Boot is used to conceal the IR flash cable and optional solar power cable. The boot is installed by sliding it onto the bottom of the IR flash unit and then securing it to the tree by installing a 1 5/8 inch screw into the metal



strap on the bottom of the IR Boot. When screwing down the IR boot ensure that the cables are not damaged by the screw. See Figure 6 for an example of a complete installation.



Figure 6: IR Flash Unit Left and IR Sensor Right

## 5 Painting

The convert IR flash comes pre-painted with a light dusting of paint to help camouflage it. If needed, additional paint can be added to provide additional camouflage. To maximize performance the amount of paint added to the unit should be minimized. Paint added to the IR sensor will reduce the trigger range of the IR flash while paint added to the IR Flash unit will reduce the IR light output of the flash. If needed you can apply a light dusting of spray paint to the IR flash unit and IR sensor. The IR flash unit and IR Sensor were painted at the factory with a light dusting of Krylon Camouflage spray paint. Care must be taken when applying additional paint, excessive paint may reduce performance and could possibly void the IR flash warranty.

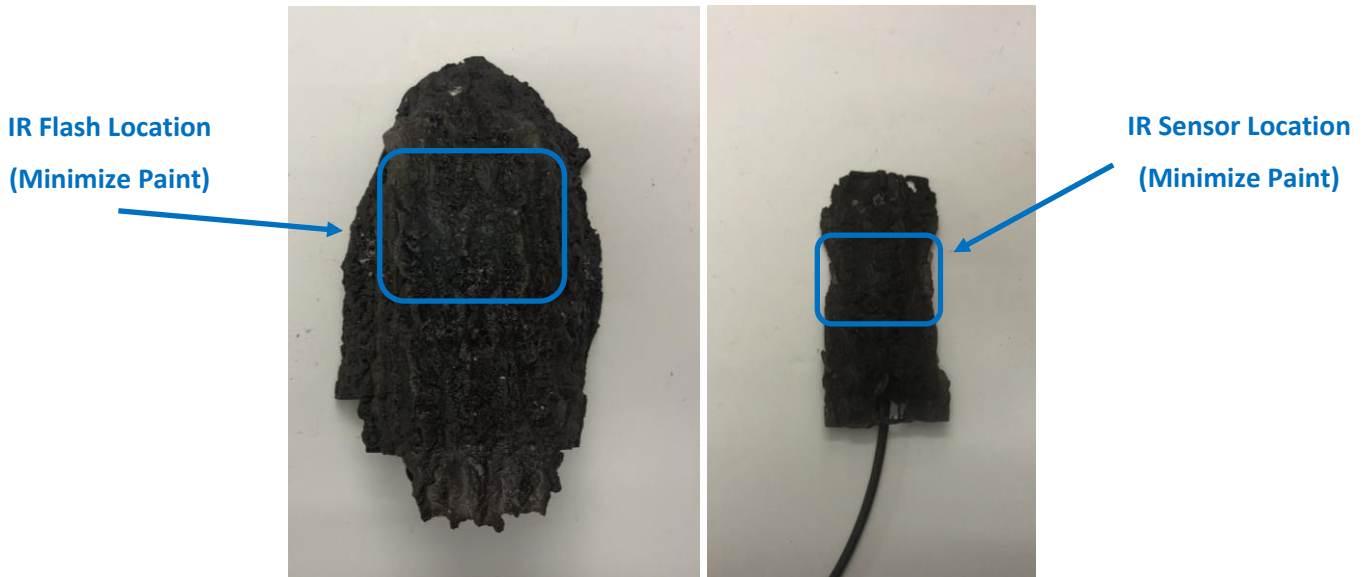


Figure 7: IR Flash Paint Location

Figure 7 shows the location of the IR flash on the IR Flash Unit and the location of the internal IR sensor on the IR Sensor unit. If painting the IR flash, care must be taken to ensure this area is not over painted as it may affect the IR flash brightness. The sides near the tree and bottom and top of the IR flash can be painted more heavily. Care should be taken when painting the IR sensor to minimize impact to the trigger range. Only a light dusting should be used on the IR sensor but be especially mindful not to overpaint the area near the internal IR sensor. The IR Boot can be painted a much as needed since it does not contain any electronics or sensors.

## 6 IR Flash Unit Positioning

The IR Flash Unit should be positioned to illuminate the area of interest. Ideally, the flash should be mounted on a tree facing away from the camera to minimize glare from the covert IR flash. Figure 8 shows the enhanced illumination with the covert IR flash when positioned facing away from the camera. As you can see the image is significantly brighter with no excessive glare.



Figure 8: IR flash Ideal Positioning

If the IR flash is positioned such that the camera can see the illuminated portion of the flash, some glare in the image is possible. Figure 9 shows an image where the camera is positioned such that it can see the side of the IR flash. This causes a bright spot to appear in the image, but the image is still very useable. The glare from the

flash may affect different models of cameras in different ways so it is something to keep in mind when positioning the camera and covert IR flash.



Figure 9: IR flash With Glare

## 7 IR Sensor Positioning and Triggering Range

The Covert IR Flash triggering range varies based on the deployment environment, alignment, camera model, camera flash power setting, camera battery levels etc. Figure 10 depicts a typical trail camera IR Flash Illumination pattern. The IR sensor must be placed somewhere inside the illuminated area. Since IR sensor is triggered by the flash from the trail camera, the brighter the flash from the trail camera the further away the IR sensor can be placed. The maximum distance from the camera will be obtained when the sensor is aligned in the center of the trail camera IR flash illumination area as depicted in Figure 10. The IR sensor will still work when not aligned in the center of the trail camera illumination area but, at a reduced range. The maximum range can be determined by the user in the field using the alignment test discussed in the next section. For ease of installation, we recommend placing the sensor closer to the camera than the maximum trigger range.

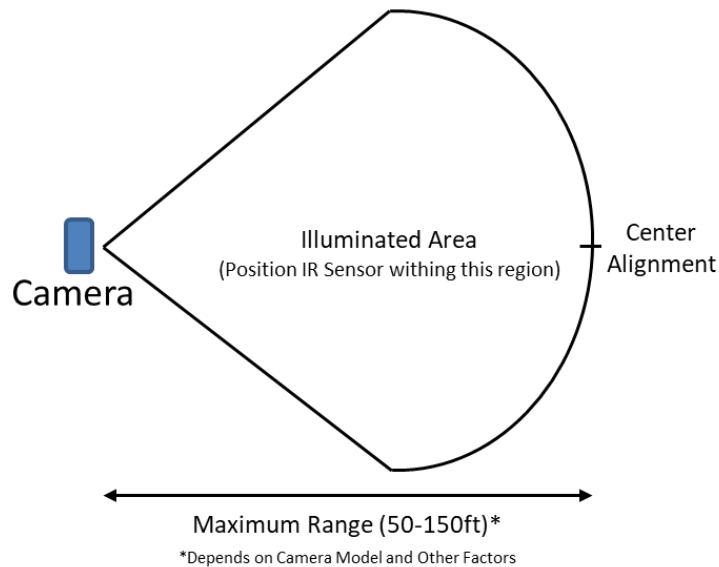


Figure 10: Typical Trail Camera Illumination Pattern



WilliamsRDM has performed tests with Spartan and Buckeye cameras to determine the maximum triggering range under ideal conditions when the IR sensor is positioned in the center of the trail camera’s flash illumination area and the trail camera flash is set to maximum brightness. Table 1 depicts the ideal ranges when aligned and should only be considered as an approximate maximum triggering range for the camera type listed. For ease of installation, we recommend placing the IR sensor closer than the maximum range.

Table 1: Trigger Range under Ideal Conditions.

| Camera Model  | Maximum Range Under Ideal Conditions |
|---------------|--------------------------------------|
| Spartan GoCam | 50ft                                 |
| Buckeye X80   | 150ft                                |

## 8 Alignment test

If the Trail Camera is not triggering the IR flash, an alignment test can be performed to test and align the position of the trail camera and IR sensor and ensure they work as desired. The test must be performed in a dark area or at night, so the Covert IR flash is active and not in its low power daytime mode. The Alignment mode is always active for 10 minutes after the IR flash unit is powered on. When in alignment mode, the red LED indicator on the front of the IR flash unit illuminates along with the IR LEDs each time the IR flash is triggered. This allows the user to easily see that the flash is active since the human eye is unable to see the IR light emitted from the covert IR flash. When performing the alignment test, the positions of the camera and/or the IR sensor can be adjusted to ensure the system works as expected. The alignment mode is automatically exited after 10 minutes from the time IR flash unit is powered on.

## 9 Batteries

The Covert IR flash is powered from two internal lithium-ion 18650 batteries and fully charged batteries will provide about 300 flashes. The batteries can be charged by connecting a WilliamsRDM Covert Solar Power system or alternatively they can be removed and charged in a standard 18650 lithium-ion battery charger.

### 9.1 Solar Charging

To ensure the IR flash can operate for long durations in remote locations it should be connected to a WilliamsRDM covert solar panel. The solar panel will ensure that the flash is recharged during the day and is ready to take additional pictures at night. The covert solar panel attaches to the 3-pin connector on the IR flash unit.

### 9.2 Non-Solar Charging

If the Covert IR Flash is used without a solar power source, then the batteries can be removed and charged via a standard lithium ion 18650 battery charger available from various retailers. See section 9.3 for removal and replacement instructions.

### 9.3 Battery Replacement

The batteries in the Covert IR flash are rechargeable but, can wear out over time as is typical of rechargeable batteries. They can be replaced with standard flat top (NOT Button Top) 18650 Lithium-Ion rechargeable batteries. We recommend Molical INR-18650-P26A which is a 3.7V 2600mAh flat top battery. Additionally, if the IR flash is being used without a solar power source, then they batteries will need to be removed for charging.



Figure 11: Battery Installation

The batteries are replaced by removing the four screws on the back of the Covert IR flash unit to open the battery enclosure (see Figure 11). The batteries can then be removed from the unit and replaced with new batteries. Pay careful attention to the battery polarity to ensure they are properly installed and pushed down into the battery holder. Additionally, ensure that both batteries are in the same charge state either new and uncharged or fully charged and of the same brand. Don't mix and match batteries of different charge states or brands as these can damage batteries and impede the function of the IR flash.

- 1) Ensure the Power Switch is in the off Position.
- 2) Remove the 4 Phillips screws from the back of the IR flash unit and remove the lid.
- 3) Remove the old batteries.
- 4) Install the new batteries ensuring they are installed in the correct orientation.
- 5) Ensure batteries are completely seated in the battery holder.
- 6) Replace the Lid and Install the 4 Phillips head screws that were removed in step 2.

## 10 Specifications

Below are the specifications for the covert IR flash

- 1) System Weight with batteries: 3.6lbs
- 2) IR flash with Boot Dimensions: 11.5" x 5" x 3"
- 3) IR Sensor Dimensions: 5.5" x 2.5" x 1"
- 4) IR Sensor cable Length: 6.5ft
- 5) Solar Power Input Voltage range: 12V – 38V
- 6) Batteries: 2x 18650 flat top Lithium-Ion Batteries